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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/079,640 05/15/98 DANIELL

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EXAMINER

FOX, D

ART UNIT

PAPER NUMBER

1638

DATE MAILED:

03/19/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/079,640

Applicant(s)

DANIELL, HENRY

Examiner

David Fox

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2001, 17 January 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-84, 86-96, 107, 118, 119, 122, 168, 169, 171-176 and 189-201 is/are pending in the application.
- 4a) Of the above claim(s) 200 and 201 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-84, 86-96, 107, 118, 119, 122, 168, 169, 171-176 and 189-199 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 13
- 18) ☐ Interview Summary (PTO-413) Paper No(s): _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

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The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The supplemental oath of 16 October 2000 has been received.

The amendment to the specification regarding the presence of color drawings is acknowledged.

The application should be reviewed for errors. Errors appear, for example, in claims 192 and 198, where "transcriptionally" in line 5 and line 7, respectively, should be replaced with --transcriptional--.

The amendment to claim 183 has not been entered, since "177" did not appear in line 1 of that claim.

The amendment to claim 181 to depend upon claim 86 is improper, since there is no antecedent basis for the term "the PBP" in claim 86. In any event, the recitation of "the PBP" in claim 181 confirms its assignment to Group III.

The amendments to claims 184-186 clarifies that these claims are in fact drawn to expression cassettes, and confirms that these claims were intended to depend upon claim 179, also drawn to an expression cassette. The recitation of "PBP" in these claims, and the lack of recitation of chloroplast flanking sequences, confirms the assignment of these claims to Group XV.

The amendment to claim 188 clarifies that it is drawn to a synthetic biopolymer, assigned to Group VII.

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Newly submitted claims 200-201 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

The claims depend upon claim 188, drawn to a biopolymer of Group VII, as stated above. It is noted that this dependency is confusing, since claims 200 and 201 are drawn to a plant. However, the Examiner was unable to guess from which claim these claims were supposed to depend.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 200 and 201 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

The amendments of 16 October 2000 and 30 October 2000, the arguments accompanying them, and the arguments filed 12 January 2001 and 17 January 2001, have obviated all rejections of record except as indicated below.

Claims 2-3, 171, 190-192 and 196-199 (newly submitted) are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 19-23, 25-29, 31 and 34 of U.S. Patent No. 5,932,479. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the reasons presented in the last office action for claims 2-84, 86-96, 107, 118-119, 122, 168-169 and 171-176.

Claims 2-3, 171, 190-192 and 196-199 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 119-120,

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12, 124, 132, 140-142, 153-157, 166-167 and 188 of copending Application No. 08/972,901.

Although the conflicting claims are not identical, they are not patentably distinct from each other because of the reasons presented in the last office action for claims 2-84, 86-96, 107, 118-119, 122, 168-169 and 171-176.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 2-84, 86-96, 107, 118-119, 122, 168-169, 171-176 (newly amended), and 189-199 (newly submitted) are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 2, 86, 190-193, 196-199 are indefinite in their recitation of "said sequences" or "which sequences", as it is unclear whether this refers to the previously recited "coding sequences" or "control sequences", or to the "chloroplast sequences" or "flanking sequences". If the latter is intended, the following amendments would obviate this rejection:

In claim 2, line 8, insert --chloroplast-- before "sequences".

In claim 86, line 12, insert --chloroplast-- before "sequences".

In claims 190 and 193, lines 8 and 10, insert --chloroplast-- before "sequences".

In claim 191, lines 8 and 10, insert --flanking-- before "sequences".

In claim 192, lines 8 and 10, insert --flanking-- after "said" and "which", respectively.

In claims 196-197 and 199, lines 9 and 11, insert --flanking-- before "sequences".

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In claim 198, lines 9 and 11, insert --flanking-- after “said” and “which”, respectively.

Claim 194 is indefinite in its recitation of “the flanking sequence which originate from an original” in lines 1-2, which is confusing and grammatically incorrect. Furthermore, the singular “flanking sequence” contradicts the implied plural of “each one” in line 2. The following amendments would obviate this rejection:

In line 1, replace “sequence” with --sequences-- and delete “which”.

In line 2, delete “an original”.

Claims 190 and 196 are indefinite in the recitation of “genome and is not directed into” in the last two lines, as it is unclear to what “is” refers. If the stable integration is intended to be described, then the following amendments would obviate this rejection:

In the penultimate line of the claims, insert a comma after “genome” and insert --wherein said stable integration-- before “is”.

Claims 191 and 197 are indefinite in their recitation of “into including” in the third line from the bottom of the claims, which is awkward and confusing. Deletion of “including” would obviate this rejection.

Claims 196-199 are indefinite in their recitation in line 2 of “introducing a universal integration and expression vector” which fails to specify where the introduction occurs. Insertion of the following phrase after “vector” in line 2 of each of these claims (as currently recited in claim 86) would obviate this rejection:

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--into the chloroplast genome of the target plant species and allowing the transformed plant to grow, the vector being--.

The rejection of the claims under 35 USC 112, first paragraph, has been withdrawn-in-part, based upon the arguments in the above-cited amendments and supplemental responses, and as indicated in the personal interview of 9 January 2001. Due to the demonstrated sequence conservation of the intergenic spacer 2 region between the trnA and trnI genes of the chloroplast genomes of higher plants, Applicant is no longer limited to the tobacco source of that spacer region.

Claims 2-3, 171 and new claims 190-192 and 196-199 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for claims limited to the intergenic spacer 2 region between the trnA and trnI genes of the chloroplast genome of higher plants, does not reasonably provide enablement for claims broadly drawn to the use of any intergenic spacer region which is highly conserved throughout higher plants and which may be used to facilitate homologous recombination and chloroplast transformation in a multitude of unrelated plant species. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims, as stated in the last office action for claims 2-84, 86-96, 107, 118-119, 122, 168-169 and 171-176.

Claims 190-191 and 196-197 (newly submitted) are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for claims limited to the intergenic

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spacer 2 region between the trnA and trnI genes of the chloroplast genome of higher plants for the homologous recombination-mediated integration of heterologous DNA into the intergenic spacer 2 region of the chloroplast genome of higher plants, does not reasonably provide enablement for claims broadly drawn to any intergenic spacer region for the integration of heterologous DNA into transcriptionally active regions of the chloroplast genome. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

The specification only provides guidance for the insertion of heterologous DNA into an intergenic region of the chloroplast genome, due to the introduction of an expression vector comprising a heterologous DNA segment flanked by a portion of an intergenic region. By definition, an intergenic region is transcriptionally silent, since there are no promoters present between two genes. The specification provides no guidance for the insertion of any heterologous DNA into a transcriptionally active region of the chloroplast genome, particularly when intergenic spacer regions are used as the flanking regions of the heterologous DNA construct. In contrast, the claims are broadly drawn to any intergenic spacer region or any other flanking region of any sequence and from any source, and the introduction into a multitude of transcriptionally active regions in the chloroplast genome of a multitude of unrelated plant species.

Given the unpredictability as stated in the last office action, and the claim breadth and lack of guidance as discussed above, undue experimentation would have been required by one skilled

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in the art to develop and evaluate a multitude of exemplified or non-exemplified intergenic spacers or other flanking regions for their ability to insert heterologous DNA into a multitude of transcriptionally active regions of the chloroplast genome of a multitude of higher plant species.

Claims 2-3, 171 and new claims 192, 198-199 are rejected under 35 U.S.C. 102(b) as being anticipated by Zoubenko et al, as stated in the last office action for claims 2-3, 86-87, 90, 92, 94, 171, 173 and 176.

Claims 2-3 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 251,654 (BIOTECHNICA), as stated in the last office action for claims 2-3, 86-87, 89-94 and 176.

Claims 2-3, 171 and new claims 192, 198-199 are rejected under 35 U.S.C. 102(b) as being anticipated by Staub et al (1993), as stated in the last office action for claims 2-9, 16-21, 31-36, 46-48, 55-57, 61-63, 86-87, 90, 92, 94-96, 107, 118, 122, 168-169, 171 and 173-175.

Claims 4-84, 86-96, 107, 118-119, 122, 168-169, 172-176, 189-191 and 193-197 are deemed free of the prior art, given the unpredictability inherent in the process as discussed above, and the failure of the prior art to teach or suggest the use of the intergenic spacer 2 region between the trnA and trnI genes of the chloroplast genome of higher plants for the homologous recombination-mediated introduction of heterologous DNA into this region of the chloroplast genome in a variety of unrelated higher plant species.

No claim is allowed.

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Applicant's arguments filed 16 October 2000, 30 October 2000, 12 January 2001 and 17 January 2001, insofar as they pertain to the rejections above, have been fully considered but they are not persuasive.

Applicant urges that the double patenting rejections are improper, given the failure of the patent's or copending application's claims to teach flanking sequences which originate from a plant species different from the target plant species, or the use of the exemplified intergenic spacer 2 region between the trnA and trnI genes as flanking regions. The Examiner maintains that claims 2, 190-192 and 196-199 specify that the flanking regions may "originate from a plant species *the same as or* different from the target plant" (emphasis added). Claim 86 is completely silent with regard to source of flanking region in relation to the target plant. With regard to the exemplified spacer region, the Examiner has removed claims which specifically recite that region from the double patenting rejections. This removal has also resulted in the complete withdrawal of the double patenting rejection involving copending application Serial No. 09/356,192.

Applicant urges that the enablement rejection is improper, given the amendments to recite higher plants, the allegation that past failures have been completely overcome by the instant invention, the demonstration of sequence conservation in the exemplified intergenic spacer 2 region and successful transformation therewith of a variety of unrelated plant species including monocots, and the teaching in the instant application of methods to isolate other appropriate intergenic spacers.

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The Examiner maintains that the advantageous features of the exemplified intergenic spacer 2 region, namely high sequence conservation, appear to be essential to the claimed invention. Given the unpredictability and claim breadth as stated in the last office action, and the lack of guidance in the instant specification as to the actual existence of any other intergenic regions with sufficiently high sequence conservation, Applicant's allegations or prophetic example are not deemed probative or sufficient to enable the broad claims. See Ex parte Forman, 230 USPQ 546, 547 (PTO Bd. App. Int. 1986), where it was taught that "the disclosure of a patent application must enable practice of the invention claimed without undue experimentation", wherein factors involved in the determination of undue experimentation were deemed to include "the quantity of experimentation necessary, the amount of direction or guidance presented, the presence or absence of working examples, the nature of the invention, the state of the prior art, the relative skill of those in that art, the predictability or unpredictability of the art and the breadth of the claims."

Applicant urges that the rejection of the claims over Zoubenko et al is improper, given the failure of the reference to teach insertion into transcriptionally active regions or the use of an intergenic region which is conserved in all plant species. The Examiner maintains that the reference has not been applied to claims which recite transcriptionally active regions. With regard to the conservation of the intergenic region, it appears that the region would be inherently conserved to some degree, absent any evidence to the contrary. It is noted that Applicant's concerns regarding the intergenic region of Zoubenko et al appear to contradict Applicant's

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assertions that the enablement rejection regarding non-exemplified intergenic regions was improper.

Applicant urges that the rejection of the claims over BIOTECHNICA ("Cannon") is improper, given the failure of the reference to teach a "universal" vector, the intergenic 2 spacer region, a transposon-free method, insertion into a transcriptionally active region, or a transcription termination sequence. The Examiner maintains that the "universality" of the vector is merely a descriptive adjective in the preamble, wherein the body of the remaining rejected claims recites features of the vector which are all taught by the reference. Note also that the rejected claims recite that the flanking regions may originate from the same species as the target plant, as discussed above. The remaining features recited above are not found in the claims which remain rejected over this reference.

Applicant urges that the rejection of the claims over Staub et al is improper, given the teaching of the intergenic region between the trnV and 16S genes as the flanking regions for the heterologous DNA construct, *not* the intergenic spacer 2 region between the trnA and trnI genes; and given the failure of the reference to teach the "universality" of the vector.

The Examiner now concedes that neither Staub et al reference teaches the insertion of heterologous DNA into the intergenic spacer 2 region between the trnA and trnI genes; accordingly, all claims which recite this feature have been removed from the rejection. Regarding the "universality" of the vector, see the discussion above regarding BIOTECHNICA.

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Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David T. Fox whose telephone number is (703) 308-0280. The examiner can normally be reached on Monday through Friday from 9:30AM to 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paula Hutzell, can be reached on (703) 308-4310. The fax phone number for this Group is (703) 308-4242.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0196.

March 15, 2001

DAVID T. FOX
PRIMARY EXAMINER
GROUP 1638

